CONSOLIDATED INFORMATION TECHNOLOGY SERVICES
TASK ASSIGNMENT (TA)

1. **TITLE:** (D402B) Support of LaRC Center Plan for Software Process Improvement

TA No:	RFC013-Rev16	
Task Area Monitor:	**Alternate Task Area Monitor:**	None
NASA POC:	**Software Control Class:**	Low Control
Type of Task:	Recurring Task	

2. BACKGROUND

The LaRC Center Plan for Software Process Improvement specifies how the NASA Software Initiative Implementation Plan will be implemented at LaRC. This Center Plan focuses on the Agency Strategy 1, which is to "Implement a continuous software process and product improvement program across NASA and its contract community". The Plan is largely based on the Capability Maturity Model Integration (CMMI) method formulated by the Software Engineering Institute of Carnegie Mellon University and proven in practice. To achieve the goal of this Plan, LaRC will use the CMMI to ultimately achieve a Level 3 rating for selected organizations and will perform additional SPI-related activities with the software developers, managers, and assurance engineers at LaRC. The LaRC Center Plan can be found at http://sw-eng.larc.nasa.gov/center_plan/plan.cfm, and the supporting work breakdown structure (WBS) can be found in the SEPG Work Area of the Aerocompass web site, http://aerocompass.larc.nasa.gov.

This task includes the following activities:
- SEPG Task Maintenance Support
- Support SEPG Operational Activities
- LaRC Center Plan Schedule Support
- Configuration Management for the LaRC SEPG
- SEPG Web Site Support
- Technical Software Engineering Writing Support for the SEPG
- Process Consultation and CMMI Appraisal Support
- Software Measurements Database
- Improve Software Engineering Training
- CMMI Process Audit Support
- AFESB Mission Support

3. OBJECTIVE

The primary objective of this task is to support the Software Engineering Process Group in its software process improvement activities as outlined in the Center Plan.

4. GENERAL IT SUPPORT SERVICES

Exceptions and Additional Requirements:
General IT Support Services Metrics apply to Work-Area Specific Services section.

General IT Support Services Performance Metrics

Performance Standard: Consultation regarding Capability Maturity Model Integration (CMMI) process areas meets customer needs.

Performance Metrics:

Exceeds: Consultation goes beyond customer needs and are high quality.

Meets: Consultation addresses requirements or project needs.

Fails: Consultation fails to address requirements or project needs.

Performance Standard: Assigned activities are accomplished satisfactorily and within the pre-determined schedule.

Performance Metrics:

Exceeds: All assigned activities are accomplished satisfactorily on or ahead of the pre-determined schedule. Suggestions are made and acted upon that lead to advancements towards the goals of the projects

Meets: Any deficiencies or slippage in one or more activities are offset by improvements or gains in other activities.

Fails: Deficiencies or slippage in assigned activities have had a detrimental effect on the objectives of the project

Performance Standard: Quality deliverables provided

Performance Metrics:

Exceeds: Products delivered ahead of schedule and/or no rework required

Meets: On-time delivery according to the current Center Plan schedule without significant rework required (over two hours)

Fails: Significant rework required and/or delivery date not met

5. SYSTEM AND APPLICATION DEVELOPMENT SERVICES

None required.

6. WORK-AREA SPECIFIC SERVICES

Work Area Title: SEPG Task Maintenance Support

LaRC Manager:

Work Area Description: Support general maintenance of the task with the LaRC SEPG.

Work Area Requirements: - Provide status to the SEPG Chair and Co-Chair on the

activities that occur each month.
-Provide Task Assignment (TA) monthly reports to the Task Area Monitor (TAM).
-Provide financial reporting on how the funds that are allocated to the task are being spent.
-Work with the TAM to implement task modifications and renewals as necessary.
-Manage and monitor customer requirements.

Work Area Title: Support SEPG Operational Activities

LaRC Manager:

Work Area Description: Provide support to the SEPG in the coordination and implementation of their normal operational activities. Examples of such support include: supporting the SEPG's involvement in the SWG Training Subgroup; providing coordination support to the CMMI assessment teams; and coordinating the yearly software inventory collection.

Work Area Requirements: - Support LaRC involvement in the SWG Training Subgroup. Gather LaRC Software Engineering training needs and draft yearly training plan. Work with SEPG to prioritize training, distribute information on upcoming classes, solicit interest in proposed classes, arrange logistics for those classes that are hosted at LaRC, participate in training telecons, assist in completing training subgroup action items. Advertise and arrange logistics for SWG related video teleconferences. Draft key activities for classes held.
- Arrange and publicize training classes identified by the LaRC SEPG; collect and evaluate training evaluations; keep records of classes held, student attendees, abstracts, and student evaluations; perform training checklist. Draft key activities for classes held.
- Gather LaRC CMMI assessment needs, draft yearly assessment plan, work with SEPG to prioritize assessment needs; track and record data on LaRC CMMI assessment activities; maintain pool of potential appraisal team members; set up the logistics (visitor badge, rooms, materials, projection equipment, scheduling multiple events for best use consultant s on site visits) for the assessments; draft key activities for assessments held. Maintain and update the assessment plan/schedules. Produce reports and viewgraphs to display the assessment activities accomplished.
- Support yearly software inventory collection. Distribute call for update to inventory, collect inventory data, perform data analysis and produce reports to display inventory data and analysis results.
- Provide additional activity coordination support, as requested to the SEPG Chair and Co-Chair.

Work Area Title: LaRC Center Plan Schedule Support

LaRC Manager:

Work Area Description: This support includes the creation and maintenance of the schedule that augments the NASA Langley Software Initiative Implementation Plan. The plan identifies four essential strategies: (infrastructure, assurance, research, and education/retention) that are directed toward advancing software engineering practices to effectively meet the scientific and technological objectives of NASA. These strategies are broken down into objectives, approaches, and tasks.

Work Area Requirements: -Stay familiar with the LaRC Center Plan for Software Process Improvement.
-Recommend a Schedule approach that promotes cost effective management of the Center Plan.
-Using Microsoft Project, create and maintain a critical path method schedule whose

architecture corresponds to the strategies and supporting activities embodied by the Center Plan (The current schedule is an attachment to this task).
-The contractor is responsible for accomplishing milestones and deliverables associated with those schedule items assigned to ConITS.
-Follow the SEPG configuration management plan (CMP) to ensure the schedule is accessible to SEPG members and under configuration management.
-On a monthly basis, work with the SEPG to update and revise the SEPG schedule. This includes recording actual start and finish dates. Track and maintain action items to closure.
-On a monthly basis, prepare a report that covers schedule status, task changes, actual hours, and present report to SEPG Chair and Co-Chair.
-On a yearly basis, prepare a report of year-to-date accomplishments, completed deliverables and milestones, and slipped tasks. Provide the report to the SEPG Chair and Co-Chair by the 15th of the month following the end of the fiscal year.

Work Area Title: Configuration Management for the LaRC SEPG

LaRC Manager:

Work Area Description: Maintain configuration control of SEPG documents and products following the SEPG's Configuration Management Plan. This includes the use of Aerocompass to baseline and archive SEPG documentation and products.

Work Area Requirements: - Following review and approval by the Configuration Control Board, place documents in the SEPG Work Area of the Aerocompass web site. When revised documents are baselined, archive outdated versions.
- Update configuration item lists to reflect baselining or archiving activities.
- Maintain organization of Aerocompass web site
- Participate in annual audits of Aerocompass SEPG work area

Work Area Title: SEPG Web Site Support

LaRC Manager:

Work Area Description: Provide ongoing maintenance and support of the SEPG web site and related databases.

Work Area Requirements: - Maintain LaRC SPII web site and related databases by performing updates, trouble shooting problems and correcting problems, and archiving current and replaced versions of files.
- Monitor the application for anomalies and respond to customer trouble reports.
- Post new and updated SEPG documents onto the NASA Process Asset Library and archive outdated documents.

Work Area Title: Technical Software Engineering Writing Support for the SEPG

LaRC Manager:

Work Area Description: Software Engineering Process Group support includes the definition, implementation, and continuous improvement of complete software development lifecycle processes and procedures for LaRC programs. The primary focus of this area is to support LaRC in implementing LaRC's Center Plan for Software Process Improvement, the software-related Langley Management System (LMS) Procedures, and the key process areas of the Software Engineering Institute's Capability Maturity Model Integration.

Work Area Requirements: -Evaluate, implement, and aid others in the use of current and new software technologies, methods, processes, and procedures.
-Assist in the implementation and improvement of software activities developed under the LMS software procedures.

-Revise the LMS software procedures and related examples and templates, and develop training courses for these procedures.
-Become and remain familiar with the Center Plan for LaRC Software Process Improvement.
-Annually, revise the Center Plan for LaRC Software Process Improvement and prepare the briefing to LaRC Center Management.
-Develop, update, revise, proofread, and/or edit other materials that support SEPG activities. This activity may include presenting some materials to their intended audience.
-Follow the SEPG configuration management plan (CMP) to ensure that all items developed under this task are under configuration management and accessible to SEPG members.
-On a monthly basis, report progress on task assignments and deliverables to the SEPG Chair and Co-Chair.

Work Area Title: Process Consultation and CMMI Appraisal Support

LaRC Manager:

Work Area Description: Provide consultation and CMMI appraisal support to LaRC projects/organizations on processes and procedures that are critical to the management and execution of projects. The processes and procedures will be consistent with goals and practices embodied in the process areas of the Software Engineering Institute's Capability Maturity Model Integration. Process areas include Requirements Management, Configuration Management, Process and Product Quality Assurance, Measurement and Analysis, Project Planning, Project Monitoring and Control, and Supplier Agreement Management. Process consultation includes the definition, implementation, and continuous improvement of processes for LaRC projects/organizations. CMMI appraisal support includes planning, coordination, and execution of activities needed to prepare for appraisals, participate in appraisals, and achieve improvements following appraisals. This work area supports implementation of the Center Plan for LaRC Software Process Improvement, the Center Plan for LaRC Requirements Improvement, and the LaRC Integrated Plan for Management and Engineering Improvement.

Work Area Requirements: - Lead the definition, development, and continuous improvement of processes and procedures for LaRC projects.
- Processes shall cover the goals of process areas of the Capability Maturity Model Integration.
- Processes related to project management shall be consistent with the Project Management Institute's Project Management Body of Knowledge, focusing on the Planning, Executing, and Monitoring and Controlling process groups.
- Guide project personnel on implementation of process practices.
- Deliver process documentation in electronic format compatible with Microsoft Office.
- Support planning, coordination, and execution of activities needed to prepare for appraisals, participate in appraisals, and achieve improvements following appraisals.
- Coordinate planning of appraisals, including workshops and pre-appraisals, with LaRC project/organization representatives, the lead appraiser, and other key stakeholders.
- Participate in workshops, pre-appraisals, and related events to obtain insight into LaRC project/organization mission, goals, and objectives.
- Participate on appraisal teams to assist the lead appraiser with the evaluation of LaRC projects/organizations. The appraisals will be conducted by an authorized lead appraiser approved by the Software Engineering Institute.
- On a monthly basis, report progress to the SEPG Chair and Co-Chair

Work Area Title: Software Measurements Database

LaRC Manager:

Work Area Description: This work area encompasses the development of a software measurements database, including a Web-based user interface and data analysis, reporting, and exporting capabilities. The software measurements database is an integral part of LaRC s measurement program for software projects. The database will provide a Center-level repository for storing measurement data supplied by software projects and serve as a source for analyzing and reporting software project performance in the aggregate. Details of LaRC s software measurement program will be provided as they become available. This work area supports implementation of the Center Plan for LaRC Software Process Improvement and the NASA Software Engineering Initiative Implementation Plan.

Work Area Requirements: - Perform development of the software measurements database, including user interface and data analysis, reporting, and exporting capabilities.
- Perform development in accordance with technical requirements (TBD).
- Meet with LaRC personnel in order to finalize technical requirements
- Perform planning, coordination, and execution of activities needed to develop the software measurements database.
- Prepare acceptance testing procedures.
- Conduct acceptance testing. Acceptance testing will be witnessed by NASA.
- Deliver documentation in electronic format compatible with Microsoft Office.
- On a monthly basis, report progress to the SEPG Chair and Co-Chair.

Work Area Title: Improve Software Engineering Training

LaRC Manager:

Work Area Description: This work area includes activities pursuant to the acquisition, evolution, and delivery of training classes, workshops, and similar events relevant to software engineering improvements. Relevant areas include software engineering, software management, software assurance (including software safety), software acquisition, and systems engineering (i.e., software-intensive systems). The intent of this work area is to: obtain training that closely matches NASA needs, conduct and evaluate the training, improve the training for NASA-wide use, and validate the improved training. This work area also includes improving and validating software tools which are incidental to the respective software engineering training classes. The goal of this work area is to provide training classes that impart techniques, methods, and tools that enable compliance with NPR 7150.2, NASA Software Engineering Requirements.

Work Area Requirements: - Perform planning, coordination, and execution of activities needed to acquire relevant training classes. Relevant training classes include software engineering, software management, software assurance (including software safety), software acquisition, and systems engineering (i.e., software-intensive systems).
- Schedule and arrange training classes
- Conduct relevant training classes
- Validate training effectiveness
- Provide information for input to student records
- Evaluate training (including incidental software tools) and recommend improvements to class content (missing/extraneous/organization), duration (shorter/longer), student exercises (more/fewer), and software tool usability, effectiveness, and applicability to NASA projects.
- Implement and validate improvements to training classes (and incidental software tools).

- Deliver documentation in electronic format compatible with Microsoft Office.
- On a monthly basis, report progress to the SEPG Chair and Co-Chair.

Work Area Title: CMMI Process Audit Support

LaRC Manager:

Work Area Description: This work area encompasses the performance of process audits on selected Class A, B, or C projects to accomplish CMMI Process and Product Quality Assurance (PPQA) Specific Practice 1.1 and Generic Practice 2.9. The text below provides further details on the requested PPQA audits:

PPQA SP 1.1 Objectively Evaluate Processes: Objectively evaluate the designated performed processes against the applicable process descriptions, standards, and procedures. This would be performed on all applicable CMMI Process Areas (PA) and all applicable NASA policies, requirements, and standards (e.g., LMS software procedures, NASA-STD 8739.8 NASA Software Assurance Standard, NASA-STD 8719.13 Software Safety Standard). This would fulfill the CMMI Generic Practice (GP) 2.9 for all applicable process areas except PPQA. This entails performing two types of audits: CMMI Process Audits and LMS/NASA Audits as outlined below.

PPQA GP 2.9 Objectively Evaluate Adherence: Objectively evaluate adherence of the process and product quality assurance process against its process description, standards, and procedures, and address noncompliance. This would apply to the whole process area of PPQA. This is basically an audit on the PPQA SP 1.1 and SP1.2 auditors; therefore, this would have to be performed by a source other than the provider of the PPQA SP 1.1 audits discussed above.

Work Area Requirements: CMMI Process Audits (monthly audits to cover 2 process areas per month):
- Perform CMMI Process Audit preparations
- Conduct CMMI Process Audits
- Document results and discuss with project leads
- Debrief preparation (create results briefing)
- Conduct debrief with Branch Head and SEPG Chair

LMS/NASA Audits (annual audits):
- Perform LMS/NASA Audit preparations
- Conduct LMS/NASA Process Audits
- Document results and discuss with project leads
- Debrief preparation (create results briefing)
- Conduct debrief with Branch Head and SEPG Chair

Other Audit Related Actions to Perform:
- Train personnel as necessary to perform the CMMI Process Area and LMS/NASA audits.
- Maintain Process Audit schedule and archive process audit artifacts.
- Ensure actual hours expended are tracked

Work Area Title: AFESB Mission Support

LaRC Manager:

Work Area Description: The contractor will work with Langley Software Engineering Process Group (SEPG) consultants to assist the Atmospheric Flight & Entry Systems Branch (AFESB) to ultimately achieve the CMMI Level 2 appraisal rating required by NPR 7150.2. The contractor will also perform software process improvement related activities with the AFESB staff to bring them into compliance with NPR 7150.2 and its associated

standards, and LMS software procedures. The CMMI, NPR 7150.2, and LMS will be used as benchmarks against which to evaluate AFESB s current practices and identify its software engineering deficiencies/non-compliances. Eliminating the identified deficiencies by putting in place plans, processes, techniques, and tools will bring the Branch into compliance with the NPR.

The contractor will further assist AFESB in achieving NPR compliance by performing many of the CMMI, NPR, and LMS engineering management requirements for the Branch s various mission support tasks. This will be accomplished by first performing the engineering management requirements on a representative subset of the AFESB mission support tasks (pilot tasks) and then expanding the set of tasks to encompass all applicable Branch mission support tasks.

Work Area Requirements: - The contractor shall gain an understanding of the current Branch mission support tasks and processes by performing activities such as observing AFESB day-to-day practices, attending task meetings and branch meetings, reading project documents (existing project plans, contract information, configuration management plans and records, etc.). The contractor shall record in a Mission Support Task Descriptions document a brief description of each mission support task examined and its associated NPR 7150.2 software class(es).
- The contractor shall work with the Branch Head and the SEPG consultants to select a representative subset of AFESB mission support tasks to participate as pilots in the improvement activities. These mission support tasks must be representative of the different types of mission support performed by the Branch and should contain NPR 7150.2 Class A or B software. There will be two to four mission support tasks chosen for pilots. The contractor shall document the Pilot Tasks chosen along with point of contact information for key task members.
- The contractor shall work with the Branch Head and the SEPG consultants to understand Branch business goals, determine the priority order of implementing CMMI process areas, and establish an appropriate schedule for implementing improvement activities. The Priority Order of Addressing CMMI Process Areas shall be documented.
- The contractor shall work with the SEPG consultants to identify NPR, CMMI, and LMS gaps in compliance through CMMI SCAMPI C appraisals, audits against LMS software procedures (which contain a flow down of NPR requirements), audits against NPR 7150.2, and document reviews. The gaps shall be documented in the List of Gaps in Compliance.
- The contractor shall work with the SEPG consultants to identify the most time- and cost-effective improvement approaches to eliminate gaps in compliance. The contractor shall implement identified improvements to eliminate gaps in compliance by performing engineering management activities (such as writing, modifying, and maintaining plans for the mission support tasks; collecting and reporting status on progress in implementing plans; identifying, recommending, and planning corrective actions when progress deviates significantly from plans; tracking mission support task risks). The contractor shall document the Engineering Management Plans and Artifacts (i.e., products and artifacts developed to obtain compliance with NPR 7150.2 and LMS software procedures). The contractor shall work one-on-one with the staff of the pilot mission support tasks to eliminate the remaining gaps in compliance. The contractor shall provide training and guidance on activities that must be performed and templates or examples corresponding to products that must be produced. (For example, training or guidance on performing requirements bi-directional traceability and requirements management; documenting fully compliant designs, software test procedures, and test reports; identifying risks to mission support task success.) The contractor shall document the Mission Support Task Artifacts (i.e., training materials,

templates, and examples used to help mission support tasks achieve compliance with NPR 7150.2 and LMS software procedures).
- The contractor shall work with the SEPG consultants and the LaRC Safety and Mission Assurance Office/ Mission Assurance Branch representative to develop Software Assurance Documentation to meet the requirements specified in NASA-STD-8739.8: NASA Software Assurance Standard and train the mission support task staff in their roles in implementing assurance.
- The contractor shall attend the NASA Software Safety Training class provided by NASA Headquarters at or near LaRC. The contractor shall subsequently document gaps in compliance between the pilot mission support tasks and the NASA-STD-8719.13: Software Safety Standard applicable requirements and provide a monthly Software Safety Compliance Report describing the gaps in compliance and the activities being performed to eliminate the gaps.
- The contractor shall participate in process audits of the AFESB pilot mission support tasks to look for remaining gaps in compliance and document the gaps in the List of Gaps in Compliance.
- The contractor shall work with the SEPG consultants to develop and present a monthly status briefing to the AFESB Branch Head which covers the following items: major activities performed that month; summary of identified gaps in compliance and progress in eliminating them; appraisal and audit results; and issues/actions and risks to achieving compliance that need to be addressed. At the monthly briefings, the contractor shall deliver Status on Mission Support Tasks from an engineering management perspective. At the monthly briefings, the contractor shall also deliver a Report on Monthly and Cumulative Effort Expended which contains a detailed itemized breakdown of the activities/accomplishments and corresponding contract hours expended.
- As pilots progress successfully, the contractor shall work with the Branch Head and the SEPG consultants to expand improvement activities to eliminate gaps in compliance to other AFESB mission support tasks.

7. Exhibit A

None required.

8. SPECIAL SECURITY REQUIREMENTS

None required.

9. SOFTWARE ENGINEERING PROCESS REQUIREMENTS

None required.

10. JOINT REVIEW SCHEDULE

Joint reviews will be held monthly to report on work conducted and costs incurred during the previous month.

11. PERIOD OF PERFORMANCE

This TA is effective from 02/01/05 to 04/27/10

12. TECHNICAL PERFORMANCE RATING

In evaluating Technical Performance, quality and timeliness related to Configuration Management for the LaRC SEPG shall be rated as follows:

Quality: 60% Timeliness: 40%

In evaluating Technical Performance, quality and timeliness related to SEPG Task Maintenance Support, Support SEPG Operational Activities, LaRC Center Plan Schedule Support, SEPG Web Site Support, Technical Software Engineering Writing Support for the SEPG, Software Measurements Database, and Improve Software Engineering Training shall be rated as follows:

Quality: 80% Timeliness: 20%

In evaluating Technical Performance, quality and timeliness related to Process Consultation and CMMI Appraisal Support shall be rated as follows:

Quality: 60% Timeliness: 40%

In evaluating Technical Performance, quality and timeliness related to CMMI Process Audit Support and AFESB Mission Support shall be rated as follows:

Quality: 70% Timeliness: 30%

13. RESPONSE REQUIREMENTS

Within two weeks from the receipt of this task assignment, submit to the Contracting Officer's Representative, an orginal and two copies of a Task Plan. This Task Plan shall address the contractor's lead personnel; specific work plans; and the associated estimated labor hours, cost and schedule. Include a signature block for concurrence by the Contract Manager and approval by the Contracting Officer's Representative.

14. FUNDING INFORMATION

Funding last submitted on 09/08/2009.

15. MILESTONES

None required.

16. DELIVERABLES

Number	Deliverable Item	Deliverable Schedule
1	Monthly hour and cost report (ConITS Actual Costs Subtask)	Monthly following the approval of the task; will include data for each subtask and the parent task to TAM,.
2	SEPG Status Log	Monthly following the approval of the task; will include data for each subtask and the parent task

		to TAM,.
3	Deliverables for work assigned to contractor in the Center Plan Schedule	Refer to schedule for specific deliverables. Draft documents will be delivered for SEPG review
4	Monthly Schedule Report to SEPG Chair and Co-Chair	Monthly following approval of the task; will include monthly schedule status provided by the SEPG team members.
5	Updated Center Plan Schedule in MS project format posted to the Aerocompass site	As changes warrant.
6	Updated Configuration Item list	The Configuration Item list shall be updated to reflect new or updated items as they are added to the SEPG Configuration Management Library on aeroCOMPASS.
7	Files stored in Configuration Management library	New files will be added to the CM library on aeroCOMPASS and outdated files will be archived according to the CM Plan within 48 hours of baseline notification.
8	End of Year Schedule Report to SEPG Chair and Co-Chair	Due 15 days after the end of the fiscal year; will include year-to-date schedule status provided by SEPG team members.
9	Mission Support Task Descriptions [AFESB]	Four weeks after Task Order initiation
10	Pilot Tasks [AFESB]	Five weeks after Task Order initiation
11	Priority Order of Addressing CMMI Process Areas [AFESB]	Five weeks after Task Order initiation
12	List of Gaps in Compliance [AFESB]	Initial delivery one week after the first CMMI SCAMPI C appraisal, thereafter updated monthly
13	Engineering Management Plans and Artifacts [AFESB]	Initial delivery 60 days after task initiation and thereafter updated monthly
14	Mission Support Task Artifacts [AFESB]	Initial delivery 80 days after task initiation and thereafter updated monthly
15	Software Assurance Documentation [AFESB]	Initial delivery 4 months after task initiation and thereafter updated monthly
16	Software Safety Compliance Report [AFESB]	Initial delivered 60 days after the NASA Software Safety Training class is complete, thereafter monthly
17	Status on Mission Support Tasks [AFESB]	Monthly face-to-face meeting beginning 90 days after task initiation
18	Report on Monthly and Cumulative Effort Expended [AFESB]	Monthly face-to-face meeting beginning 30 days after task initiation

17. FILE ATTACHMENTS

None.